

by a 'ha ha' wall. This gives a most pleasant and peaceful outlook towards the Thames.

I believe you will have the opportunity of walking round the Grounds before you leave, and I sincerely hope you will be favourable impressed by our efforts so far.

Before closing, I should like to bring you up to date with what has happened since our opening day. In spite of the appalling weather this summer we reached 300,000 visitors by the middle of September, which was about a week before the budgeted time. The response of visitors has been most enthusiastic and the success of the project has been all that could have been hoped for. We now find exhibitors falling over themselves, to join the project. It is hoped that within the next year or so we shall have had about a million visitors through the gates, and further expenditure is being planned for this coming winter in improving both garden layout and providing extended amenities for our visitors.

POTTING AND CONTAINERISING

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In this short illustrated talk, I will not be able to give a comprehensive survey of the subject but a series of disjointed facts. I do, however, want to pin-point huge differences that exist from nursery to nursery and suggest a few ways in which British Chapter of the I.P.P.S. could be of benefit to the industry. Although today I am concentrating on getting the plant into the pot I would like to point out that a great deal of study is needed on the movement and handling of plants in containers within the propagation department. This is a difficult subject to tackle in existing units which frequently consist of old glasshouses and narrow paths but it is one which should be given primary consideration in the design of any future propagation unit.

Before getting too deeply involved in my subject, could I clarify that both potting and containerising refers to the same process, the former being used more widely in this country, while the word 'containerising' has been introduced from the U.S.A. and is often used when referring to potting larger subjects. I will be using both during the course of my talk.

There are three essential ingredients in any potting process: —

1. Plants,
2. Growing Medium,
3. Pots or Containers.

How do each of these influence the process?

Plants

The size and stage of growth of seedlings and cuttings have a large influence on the speed of the potting process and

resultant growth of the plant. In crops where extensive research has been carried out i.e. tomatoes, it is now an accepted practice to pot at the two-leaf stage. Further research on hardy nursery stock could well show that other crops benefit from early potting. The effect of the size of the plant on potting may be summarized as follows:—

Plants larger than necessary will result in

- (a) slower potting
- (b) plants suffering great set-backs.

Plants smaller than necessary will result in

- (a) plants difficult to handle
- (b) a tendency for plants to be potted too deeply
- (c) setbacks resulting from over-watering

Generally it is better to pot when plants are too small than too large.

Growing Medium

We are all fully aware of the effects of compost on growth and the resultant crops and this must always be of major importance when choosing a compost. Today I am only concerned with the influence which the weight and texture of the compost has on potting.

I have always found that staff prefer to pot with a peat and sand compost as against John Innes compost which can often be lumpy and contain small, sharp stones. Peat compost is definitely lighter than a soil based medium. Machines, however, have slightly different requirements since the highly organic compost does not 'run well' and needs a lot agitation if it is to be hopper fed. Composts with a high proportion of sand therefore are definitely more desirable for machine potting.

Pots and Containers.

There are too many types to consider individually but I would like to make the following observations about crock versus plastic pots. During a recent European tour I questioned many nurserymen and research workers on results of their experiments with crock versus plastic pots and came to this conclusion:—

Plants in plastic pots grow away more quickly than those in clay pots during the first months after potting but after a period of a few months plants in clay pots grow more satisfactorily and will overtake those grown in plastic pots. This would indicate that quick growing short-term crops should be grown in plastic pots while those requiring to stay in the same pot for more than nine months should be grown in clay pots. This is, of course, ignoring all other advantages and disadvantages of the two materials.

I look forward to the day when the six, seven and eight inch soft plastic pots for shrub and rose growing can be replaced by a cheap rigid pot since this will greatly increase the speed of containerising. Co-operation between nurserymen

will most certainly bring this date forward since manufacturers need a large guaranteed order before they invest in expensive machinery required to produce this type of pot. May I also make a plea for standardization of pot sizes, especially in the sizes of the soft plastic pots just mentioned?

Hand Potting

One hears of great variation in speed obtained by hand-potting which of course can be influenced by so many factors. Most people, however agree that it is not putting the plant into the pot which is the major problem but the organization and supply of compost and pots and the removal of the finished article from the bench. Most existing potting sheds are too small to allow much mechanisation of handling, but it may be possible to build a soil hopper outside a shed with a shoot into the potting bench. This hopper could then be filled by a tractor with fork lift. Roller conveyors can often be used effectively to remove and store the finished article away from the bench until they can be moved to their permanent position. Once the process has been planned the rest is up to the individual; possibly incentive schemes might provide a worthwhile stimulus.

Pot-More bench

This is a useful aid to quick potting in situ. It is easily mobile and used in greenhouses with paths of 21 inches width and above. It consists basically of a hopper and potting platform with pull out shelves on either side of the bench to hold the empty pots. One of its main features are the two recesses in the potting bench to allow two pots to lay flush with each platform. The machine was developed on the nursery of P.H. Dodgson, Fordingbridge, Hampshire but is now being handled by Terra Force Ltd., East Malling, Kent.

POTTING MACHINES

Most of the potting machines listed below were illustrated by slides. The following note summarises their uses, approximate costs and my personal observations.

Plantarex

Type of pot handled	—	Rigid
Pot size handled	—	3½-5 inches
Speed of potting	—	between 600-1600 per hour depending on pot and plant size.

Cost

—

Manufacturer

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General comments:— I have had personal experience with this machine and would recommend it to anybody who pots 50,000 and up in the 3½ inch size range per year. It is well built and has been used on the Continent for a number of years. Very accurate measurement of soil per pot is obtained and firmness is produced by agitation.

Creswick

Type of pot	— Rigid
Pot size	— 2 ³ / ₄ -3 ³ / ₄ inches
Speed of potting	— 1,200 pots per hour with three operatives
Cost	— £960 ex works
Manufacturer	— Femco Engineering Co. Ltd., Hornscross, Greenhithe, Kent.

General comments:— All pot feeding and handling operations are fully automatic and movements are powered by pneumatic cylinders and valves. A special feature of this machine is the pre-loading arrangement of pots. The pots are loaded into a drum having six compartments, each carrying eighteen pots; there is also a refinement of the compost dispensing mechanism which enables either bulbs or plants to be handled.

Mayer

Type of pot	— Rigid
Pot size	— up to 6 ¹ / ₂ inches
Speed of potting	— up to a maximum of 2,500 pots per hour.
Cost	— £600 ex works
Distributor	— The machine is handled in Holland by Javo of Noordwijkerhout.

General comments:— I have no personal experience of this machine but felt that it was worthwhile bringing it to the notice of those present.

Pakit

Type of pot	— Rigid
Pot size	— 1-5 gallon containers
Speed of potting	— 700 per hour two operatives
Cost	— £2,000 without compressor
Distributor	— Formart Containers Inc., Wisconsin, U.S.A.

General comments:— Again no personal experience. The entire machine is run by air except for an electric motor which runs the hopper agitator. A stream of compressed air carries the packing material into the container. Because of the turbulence of the air, the packing material becomes arranged uniformly around the roots of the plant, within the pot.

Potall

Type of pot	— Rigid and non-rigid
Pot size	— 4-10 inches.
Speed of potting	— Variable but in the region of 250 per hour with 6 inch pots

Cost	— £400, including variable speed motor drive, and operator's seat
Manufacturer	— Terra Force Ltd., East Malling, Kent.

General comments:— The main attraction of this machine is that it enables the soft plastic pot to be potted more efficiently and quickly. The compost is settled by means of an agitator which also returns unused soil to the soil hopper.

I am sure we will see further developments of potting machines, since engineers are confident of being able to produce fully automatic machines for our purpose but are unable to speculate the money required to develop such a machine for a relatively small market.

It is in this field that international co-operation will speed the development of such a machine.

What of the future?

I am sure within ten years that there will be available an inert growing material which does not need a container to retain its shape; it would be moisture, heat retentive and porous. It could be stained any colour and formed into shape on the Nursery, depending on which plant was to be potted. plant nutrients would be added as and when required.

Potting on with this type of material would consist of inserting the existing 'pot' into a pre-formed sleeve of the same material to give the plant further root-run. This operation would be very speedy and could be repeated a number of times until the plant was in the final 'pot' size.

This proposed Society offers great scope for exchanging ideas, since we are all meeting new problems and although at last some research is being done in this country we can all gain a lot from our own personal experiences.

THE PROPAGATION OF HERBACEOUS STOCK

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First of all I must apologise for not being able to be present at this inaugural meeting to form a British Chapter of the International Plant Propagators' Society. I am fully in agreement with its aims and principles and therefore hope that my talk will have some useful contribution to the day's proceedings.

Before going into the actual part of herbaceous propagation itself I should like to explain the position we at Bressingham are trying to fill in the horticultural industry and the trends we see from our vantage point in Norfolk.